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10/088,476	03/20/2002	Shinya Hirota	112340	2940

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Oliff & Berride  
P O Box 19928  
Alexandria, VA 22320

EXAMINER

NGUYEN, TU MINH

ART UNIT	PAPER NUMBER
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3748

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DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/088,476

Applicant(s)

Hirota et al.

Examiner

Tu M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Apr 25, 2003
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 15-21 is/are rejected.
- 7) ☒ Claim(s) 8-14 is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Mar 20, 2002 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 4 6) ☐ Other:

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### DETAILED ACTION

1. This Office Action is in response to an Applicant's Response to Election Requirement filed on April 25, 2003.

Applicant's arguments with respect to the examiner's Restriction Requirement filed on March 25, 2003 are deemed persuasive; therefore, the examiner's Restriction Requirement is hereby withdrawn and all claims in the pending application are examined in their full merits. Overall, claims 1-21 are pending in this application.

#### *Specification*

2. This application does not contain an abstract of the disclosure as required by 37 C<sup>F</sup>AR

1.72(b). An abstract on a separate sheet is required.

OK

#### *Claim Objections*

3. Claim <sup>2</sup>~~3~~ is objected to because on line 2 of the claim, the phrase "can" renders the claim indefinite and should be deleted. Appropriate correction is required.

OK

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*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuda et al. (U.S. Patent 5,489,319).

Re claim 1, as shown in Figure 1, Tokuda et al. disclose an exhaust gas purification apparatus, for an engine having a combustion chamber, comprising:

- an exhaust passage (2),
- a particulate filter (3) arranged in the exhaust passage for removing particulates in exhaust gas exhausted from the combustion chamber by oxidation,
- a device (8, 9) for controlling characteristic of the exhaust gas flowing into the particulate filter, and
- means (temperature sensors (13, 14)) for judging if the particulate filter will be deteriorated by heat derived from the oxidation of the particulates,

wherein, when the judging means judges that the particulate filter will be deteriorated by heat, the controlling device changes the characteristic of the exhaust gas flowing into the

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particulate filter to prevent the particulate filter from being deteriorated by heat (see at least Figure 3 and line 55 of column 4 to line 51 of column 5).

Re claim 2, as shown in Figure 3, in the exhaust gas purification apparatus of Tokuda et al., the controlling device controls the amount of the exhaust gas flowing into the particulate filter and wherein, when the judging means that the particular filter will be deteriorated by heat (step 303 with YES answer), the controlling device performs one of a first control operation (step 313) to make the amount of the exhaust gas flowing into the particulate filter smaller than a first threshold and a second control operation to make the amount of the exhaust gas flowing into the particulate filter larger than a second threshold which is larger than the first threshold (step 305 with YES answer and step 315).

Re claim 3, in the exhaust gas purification apparatus of Tokuda et al., the apparatus further comprises a bypass mechanism (valves (8, 9) and bypass pipe (6)) for making at least a part of the exhaust gas bypass the particulate filter, and wherein the controlling device makes the amount of the exhaust gas flowing into the particulate filter smaller than the first threshold by the bypass mechanism making at least a part of the exhaust gas bypass the particulate filter (see Figure 3).

Re claim 6, in the exhaust gas purification apparatus of Tokuda et al., the judging means judges that the particulate filter will be deteriorated by heat when the temperature of the particulate filter is higher than a predetermined temperature.

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Re claim 7, in the exhaust gas purification apparatus of Tokuda et al., the predetermined temperature is a temperature at which the particulate is ignited.

6. Claims 1, 6, and 7 are further rejected under 35 U.S.C. 102(b) as being clearly anticipated by Pattas (U.S. Patent 5,582,002).

Pattas discloses an exhaust gas purification apparatus, comprising all of the features and limitations as claimed.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 6, 7, and 15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Houdry et al. (U.S. Patent 3,189,417).

Re claim 1, as shown in Figure 1, Houdry et al. disclose an exhaust gas purification apparatus, for an engine having a combustion chamber, comprising:

- an exhaust passage,
- a catalytic converter (2) arranged in the exhaust passage for removing particulates in exhaust gas exhausted from the combustion chamber by oxidation,

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- a device (36) for controlling characteristic of the exhaust gas flowing into the catalytic converter, and

- means (84, 90, 96) for judging if the catalytic converter will be deteriorated by heat derived from the oxidation of the particulates,

wherein, when the judging means judges that the catalytic converter will be deteriorated by heat, the controlling device changes the characteristic of the exhaust gas flowing into the particulate filter to prevent the catalytic converter from being deteriorated by heat (lines 15-38 of column 2).

Houdry et al., however, fail to specifically disclose that the catalytic converter also functions as a particulate filter.

The catalytic converter in Houdry et al. purifies a majority of harmful emissions which include soot, NO<sub>x</sub>, unburned HC, and CO in the exhaust gas of an internal combustion engine. Since soot is trapped and oxidized within the catalyst pellets (22), it is at least obvious to one with ordinary skill in the art that the catalytic converter (2) in Houdry et al. is also a particulate filter.

Re claim 6, in the apparatus of Houdry et al., the judging means judges that the particulate filter will be deteriorated by heat when the temperature of the particulate filter is higher than a predetermined temperature (1900°F).

Re claim 7, in the apparatus of Houdry et al., the predetermined temperature is a temperature at which the particulate is ignited.

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Re claim 15, in the apparatus of Houdry et al., the apparatus further comprises a reverse mechanism (36) for reversing the inflowing direction of the exhaust gas flowing into the particulate filter.

9. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuda et al. as applied to claim 2 above, in view of official notice.

Re claim 4, the apparatus of Tokuda et al. discloses the invention as cited above, however, fails to disclose that the controlling device makes the amount of the exhaust gas flowing into the particulate filter smaller than the first threshold by reducing the amount of the air taken into the combustion chamber, and makes the amount of the exhaust gas flowing into the particulate filter larger than the second threshold by increasing the amount of the air taken into the combustion chamber.

It is well known to those with ordinary skill in the art that a means to control an amount of the exhaust gas flowing in an exhaust system of an engine is to control an amount of air entering into a combustion chamber. Thus, Tokuda et al. can also reduce an amount of the exhaust gas flowing into the filter by reducing an amount of air into a combustion chamber. Therefore, such disclosure by Tokuda et al. is notoriously well known in the art so as to be proper for official notice.

Re claim 5, in the modified apparatus of Tokuda et al., the controlling device reduces the amount of the air taken into the combustion chamber by reducing the engine speed, and increases the amount of the air taken into the combustion chamber by increasing the engine speed.



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10. Claims 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuda et al. as applied to claim 1 above, in view of Maaseidvaag et al. (U.S. Patent 6,167,696).

Re claims 16 and 17, the apparatus of Tokuda et al. discloses the invention as cited above, however, fails to disclose that a precious metal catalyst and an active oxygen release agent are carried on the particulate filter.

As shown in Figures 1 and 4 and indicated on lines 30-38 of column 6, Maaseidvaag et al. teach the use of an integral NOx trap and particulate filter (filter (22)) to trap soot and NOx from the exhaust gas. The partition wall (42) of the filter (22) has a wash coat (54) carrying a noble metal (platinum) and an alkali metal (potassium or lithium). The noble metal and alkali metal are known as oxygen absorbing and active-oxygen releasing agents, and active-oxygen released from the oxygen absorbing and active-oxygen releasing agent oxidizes the trapped particulates. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the filter taught by Maaseidvaag et al. in the apparatus of Tokuda et al., since the use thereof would have purified both harmful soot and NOx emissions in the exhaust gas.

Re claim 18, in the modified apparatus of Tokuda et al., the active oxygen release agent is comprised of an alkali metal (potassium is used in Maaseidvaag et al.).

Re claim 19, in the modified apparatus of Tokuda et al., the alkali metal and alkali earth metal are comprised of metals (potassium in Maaseidvaag et al.) higher in tendency toward ionization than calcium.

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Re claim 20, in the modified apparatus of Tokuda et al., the particulates adhering on the particulate filter are oxidized by temporarily making the air-fuel ratio of a part or whole of the exhaust gas rich (in Maaseidvaag et al., the air-fuel ratio of the exhaust gas is made rich to reduce the trapped NO<sub>x</sub> and to oxidize the soot adhering on the filter).

Re claim 21, in the modified apparatus of Tokuda et al., a NO<sub>x</sub> absorbent (wash coat (54) in Maaseidvaag et al.) for absorbing the NO<sub>x</sub> in the exhaust gas when excess oxygen is present in the surroundings and releases the absorbed NO<sub>x</sub> when the concentration of oxygen in the surroundings falls is carried on the particulate filter and wherein the characteristic of the exhaust gas flowing into the particulate filter is returned to the original characteristic when a predetermined period has elapsed from when the controlling device changes the characteristic of the exhaust gas, and sulfur adhering on the particulate filter is disassociated from the particulate filter by making the air-fuel ratio of a part or the whole of the exhaust gas rich (see Figure 3 in Maaseidvaag et al. where a process is performed to desulfurize the filter (22)).

***Allowable Subject Matter***

11. Claims 8-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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*Prior Art*

12. The IDS (PTO-1449) filed on September 12, 2002 has been considered. An initialized copy is attached hereto.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents:

- Houdry (U.S. Patent 2,946,651), Poullot et al. (U.S. Patent 3,796,546), and Matros et al. (U.S. Patent 6,314,722), each discloses a reversible exhaust gas purification device.

- Fujiwara et al. (Japan Publication 7-4225) disclose a filter with reversible regenerating gas system to prevent the filter from being heat damaged.

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*Communication*

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 872-9302. For After Final communication, the fax phone number is (703) 872-9303.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1148.

*Tu M. Nguyen*

TMN

Tu M. Nguyen

June 16, 2003

Patent Examiner

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